

**KILN THERMAL AND COMBUSTION CONTROL****ABSTRACT OF THE DISCLOSURE**

A kiln thermal and combustion control. A predictive model is provided of the dynamics of selected aspects of the operation of the system for modeling the dynamics thereof. The model has at least two discrete models associated therewith that model at least two of the selected aspects, the at least two discrete models having different dynamic responses. An optimizer receives desired values for the selected aspects of the operation of the system modeled by the model and optimizes the inputs to the model to minimize error between the predicted and desired values. A control input device then applies the optimized input values to the system after optimization thereof.